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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KIELIN, ERIK J

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 05/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/619,477

Applicant(s)

YAMAZAKI, SHUNPEI

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 15 February 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 2/15/02 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Specification

1. Applicant's replacement paragraph for "Page 27, Paragraph 2" on p. 2 of the Amendment filed 2/15/02, has inadvertently introduced a typographical error which Applicant is requested to correct as follows:

Replace both instances of "CF₄₉O₂" with --CF₄, O₂-- for consistency with the original paragraph. Note also that CF₄₉O₂ does not exist.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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3. Claims 2, 22, 34, and 45 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The last sentence of page 3 of the specification, regarding the problem of the prior art use of resin in contact with the metal wiring, states "Furthermore, the side surface of the metallic film 3a is touching the resin in a state where the FPC 4 is mounted, causing a problem in protecting against moisture." Therefore, the specification indicates that resin should **not** be used as the "protecting film" in contact with the side of the metal which will, according to Applicant, not protect against moisture, contrary to the objective of protecting the metal film against corrosion. Furthermore, the metals indicated in the specification for use as the metal film, for example, molybdenum (Mo) and tungsten (W) are notoriously well known to those of ordinary skill to be easily corroded by moisture; thereby supporting the fact that resin will not protect such metal films. For further verification of this see US 6,043,859 (Maeda) at col. 4, ll. 19-27. For this reason, the use of a resin as a protecting film is not enabled because it does not provide the requisite protection, as admitted by Applicant, and as known in the art.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 1-3, 7, and 10, 12, 16, and 19-23, 27, 30, 54 and 31-35, 39, 42, 55 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,169,593 B1 (**Kanaya et al.**).

Kanaya discloses a first substrate having a circuit structured with a thin film transistor (TFT); a second substrate opposing said first substrate 21 which is a driving circuit board in one embodiment; a connecting wire formed of a metallic film 22 (gate signal wire; col. 8, ll. 25-29) and a transparent conductive film (TCF) 28 (source signal wire; col. 8, ll. 50-51) in contact with the metallic film surface for connecting said circuit structured with a TFT to another circuit using an anisotropic conductive film (ACF) 80a; and a protecting film 24 in contact with a side surface of said metallic film and formed along the length direction of the lamination film, wherein said connecting wiring and said protecting film 24 are formed over said first substrate 20. (See Figs. 2G and 2H; col. 9, ll. 13-40. See also , col. 18, ll. 24-51 and Figs. 15A-15B.) Note that the protecting film 24 is the same film insulating between 22 and 28 as shown in Fig. 2F (as claimed in instant claims 20 and 32).

In another embodiment as shown in Figs. 7E-7F, **Kanaya** discloses the metal film 26 with overlying TCF 28 and protecting film 30 formed of, for example, an acrylic resin, and formed along the length direction of the lamination film and contacting a side surface of the metal film 26. (See also col. 14 -- esp. ll. 7-10, 45-67; Figs 12D, 13B.)

Regarding claim 10, see Figs. 2H, 12D, and 13B each of which show that the metal does not contact the anisotropic conductive film due to the presence of the protection films.

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Regarding new claims 54 and 55, the lamination film is formed of the same materials as the source and drain wiring. (See col. 13, lines 32-36 and especially the paragraph bridging cols. 14-15.)

6. Claims 1, 3-5 and 10, 12-15 and 19, 20, 23-25, 30, 54 and 31, 32, 35-37, 42, 55 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,636,329 (**Sukegawa et al**).

The prior art Fig. 2A-2C of **Sukegawa** showing a terminal portion of an LCD display discloses a first substrate 1 having a circuit structured with a thin film transistor (TFT); a second substrate opposing said first substrate 31a which is a flexible wiring substrate; a connecting wire formed of a metallic film 7 and a transparent conductive film (TCF) 8 in contact with the metallic film surface for connecting said circuit structured with a TFT to another circuit using an anisotropic conductive film (ACF) 10; and a protecting film 3 in contact with a side surface of said metallic film 7, wherein said connecting wiring and said protecting film 7 is formed over said first substrate 1 and formed along the length direction of the lamination film. (See also col. 3, ll. 9-33 and prior art Figs. 1A-1B.)

Fig. 4A-4B of **Sukegawa** discloses a first substrate 1 having a circuit structured with a thin film transistor (TFT); a second substrate opposing said first substrate 31 which is a flexible wiring substrate; a connecting wire formed of a metallic film 7 formed 140 nm thick from Cr, Al, W, etc. (col. 8, ll. 59-63) and a transparent conductive film (TCF) 8 in contact with the metallic film surface for connecting said circuit structured with a TFT (Fig. 3C) to another circuit using an anisotropic conductive film (ACF) 10; and a protecting film 3 in contact with a side surface of said metallic film 7, wherein said connecting wiring and said protecting film 7 are formed over

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said first substrate 1, and formed along the length direction of the lamination film. Note also that at col. 7, ll. 40-44, **Sukegawa** states, "That is, the upper layer metal wiring 7 is protected at least by double coverage with a transparent conductive film 10 and further protected, locally, by coverage with a protective insulation film 9. (See also col. 3, ll. 9-33 and prior art Figs. 1A-1B.)

Regarding claim 10, the metal does not contact the anisotropic conductive film due to the presence of the protection film and the TCF formed over and in contact with the metal.

Regarding new claims 54 and 55, the lamination film is formed of the same materials as the source and drain wiring. (See Fig. 3C and associated text.)

7. Claims 1-5, 7 and **10**, 12-14, 16, and **19**, 22-25, 27, 30, 54 and **31**, 33-37, 39, 42, 55 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,608,559 (**Inada et al**).

The prior art Fig. 2 of **Inada**, showing a terminal portion of an LCD panel, discloses a first substrate 221 having a circuit structured with a thin film transistor (TFT); a second substrate opposing said first substrate 204 which is a flexible wiring substrate; a connecting wire formed of a 300-nm thick metallic film 209 formed at and a 80-nm thick transparent conductive film (TCF) 210 in contact with the metallic film surface for connecting said circuit structured with a TFT to another circuit using an anisotropic conductive film (ACF) 211; and a protecting film 211 in contact with a side surface of said metallic film 209, wherein said connecting wiring and said protecting film 211 are formed over said first substrate 1. (See col. 1, ll. 29-34.)

Fig. 6 of **Inada** discloses a similar embodiment to the prior art figure but shows the protective film 42 of silicon nitride on the side of, and formed along the length direction of, the lamination film formed of the 300-nm thick metal film 29 with overlying 80-nm thick

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transparent conductive film 30 and anisotropic conductive film 36 (col. 8, ll. 50-51). (See also col. 7, ll. 10-30; col. 14, ll. 32-42; col. 4, ll. 24-34).

Regarding claim 10, the metal does not touch the transparent conductive film.

Regarding new claims 54 and 55, the lamination film is formed of the same materials as the source and drain wiring. (See Fig. 14 and associated text.)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-7, 10, 12-15, 19-26, 54, and 31-38, 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kanaya**.

Kanaya, as explained above, teaches each of the features of the claims except for forming the metal film from aluminum or tungsten or a laminate of tungsten and tungsten nitride. **Kanaya** does however teach provide an example of a tantalum/tantalum nitride (col. 17, ll. 44-48).

Examiner gives official notice that it is known to use aluminum and tungsten and laminates of a metal and its nitride, including tungsten, to form wiring layers. It has been held that selection of a known material based on its suitability for its intended use is *prima facie* obvious. See Sinclair & Carroll Co., Inc. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). See also In re LESHIN, 125 USPQ 416 (CCPA 1960). It would have been obvious to one

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of ordinary skill at the time of the invention to use a known metal or metal and its nitride in a laminate to form a wiring layers, according to precedent.

10. Claims 43-50, 53, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kanaya** in view of JP 8-234212 A (**Hioki**).

Kanaya, as explained above, teaches each of the features of the claims except for forming column-shaped spacers over the TFTs, wherein the material used to form the spacers is the same material as that used to form the protective film.

Hioki teaches the benefits of forming column-shaped spacers 24 over the TFTs 22 using a resin. It would have been obvious to one of ordinary skill at the time of the invention to form spacers over the TFTs of **Hioki** and form them from resin for the reasons indicated in **Hioki** -- especially because forming the spacers over the TFTs provides uniform light over the pixels.

Because **Kanaya** teaches embodiments wherein the protecting film material is made from resin, both the spacers and the protecting film are formed from the same material.

11. Claims 43-48, 53, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sukegawa** in view of **Hioki**.

Sukegawa, as explained above, teaches each of the features of the claims except for forming column-shaped spacers over the TFTs, wherein the material used to form the spacers is the same material as that used to form the protective film.

Hioki teaches the benefits of forming column-shaped spacers 24 over the TFTs 22 using a resin. It would have been obvious to one of ordinary skill at the time of the invention to form

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spacers over the TFTs of **Hioki** and form them from resin for the reasons indicated in **Hioki** -- especially because forming the spacers over the TFTs provides uniform light over the pixels.

Because **Sukegawa** teaches embodiments wherein the protecting film material is made from resin, both the spacers and the protecting film are formed from the same material.

12. Claims 1-10, 12-42, 54, 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kanaya** in view of US 6,215,077 B1 (**Utsumi** et al.).

Kanaya is applied as above and teaches each of the features of the claims except for a laminate formed specifically of a metallic film comprising aluminum with an overlying indium zinc oxide transparent conductive oxide.

Utsumi teaches the benefits of using a laminate of a metallic film 2b, 2c comprising aluminum layer 2b with overlying IZO 2a specifically for use on transparent substrates for LCDs. (See Abstract, col. 2, l. 45 to col. 3, l. 16; and especially col. 4, ll. 49-58.)

It would have been obvious to one of ordinary skill at the time of the invention to use the metallization scheme of **Utsumi** for the reasons in **Utsumi** -- at least to form a metallization free from hillocks which has a low resistance even though it incorporates a conductive metal oxide.

13. Claims 43-53, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kanaya** in view of **Utsumi** as applied to claims 1-42 above, and further in view of **Hioki**.

Kanaya in view of **Utsumi** is applied as above. **Hioki** is applied as above.

Response to Arguments

Applicant's arguments filed 2/15/02 have been fully considered but they are not persuasive.

Applicant's arguments regarding the rejection under 35 U.S.C 112(1) as not enabling are not considered persuasive for the reasons indicated in the rejection which Applicant failed to address, but instead provided different reasons. Examiner maintains Applicant's objective cannot be achieved for the reasons indicated by Applicant, and requests Applicant's to address how the objective indicated by Applicant could somehow be achieved, *absent* the critical limitation indicated by Applicant, to be essential to attain said objective.

Applicant argues that none of the references has the newly amended limitation that the protective film is not somehow formed along the length direction of the lamination of metal with overlying TCF. This is clearly in error as shown by the applied art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication from examiner should be directed to Erik Kielin whose telephone number is (703) 306-5980 and e-mail address is erik.kielin@uspto.gov. The examiner can normally be reached by telephone on Monday through Thursday 9:00 AM until 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached at (703) 306-2794 or by e-mail at olik.chaudhuri@uspto.gov. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.


EK

April 28, 2002


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